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UNIVERSITÀ DEGLI STUDI DI TORINO

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Introduction

Cord blood hematopoietic stem cell transplantation (CBHSCT) is one of the therapeutic options suitable for patients who need hematopoietic stem cell transplantation but who lack both an HLA identical siblings and an unrelated HLA matched adult stem cell donor. One of the main weaknesses of CBHSCT is a delayed neutrophil and platelet engraftment that is reported as one of the causes of the increased risk of transplant related mortality of this kind of transplantation. Some experimental clinical trials carried out both in adult and pediatric population have suggested that by direct intra-bone injection of the cord blood unit (IBCBT) it is possible to improve the engraftment rate but studies directly comparing IBCBT and intravenous CBHSCT are still missing.

Materials (or patients) and methods

Between December 2007 and April 2014, 37 patients aged from 1 to 71 years (median age 8 years, median weight 23 kg) underwent CBHSCT at our Centers: 18 had IBCBT while 19 had intravenous CBHSCT. In order to explore if direct intra-bone injection of cord blood derived hematopoietic stem cells was associated with a faster neutrophil (PMN) and platelet (PLT) recovery we retrospectively compared the cumulative incidence of PMN and PLT recovery in the two groups. In the same study population we also analyzed the impact of variables that have been previously reported as important factors in determining CBHSCT outcome, as recipient's age and weight, Total Nucleated Cell dose, CD34 þ cell dose, and number of HLA mismatches in the donor-recipient couple.

Results

We first evaluated in the entire study population (n¼ 37) if younger age was associated with an improved PMN and PLT engraftment but surprisingly we didn't find any statistically significant difference (P¼ 0,35 and P¼ 0,68 respectively). We didn't highlight a correlation between PMN and PLT engraftment and recipient's weight either (P¼ 0,2 and P¼ 0,8 respectively). Considering PMN we didn't observe any difference between engraftment rate of patients treated by IBCBT and that of patients treated by intravenous CBHSCT at any time point. At dayþ 100, cumulative incidence of PLT recovery was 67% (CI95% 48-92) for patients undergone IBCBT versus 45% (CI 95%28-73) for patients undergone intravenous CBHSCT (P¼ 0,18). Extending the follow up to more than a year cumulative incidence of PLT recovery was 72% (CI95% 54-96) for patients undergone IBCBT versus 50% (CI 95%32-77) for patients

undergone intravenous CBHSCT (P¼ 0,03). About PLT engraftment we found no statistically significant differences according to Total Nucleated Cells infused, CD34þ cells infused and HLA mismatches in donor-recipient couple and when we considered the association between TNC and CD34þ cells separately in the IBCBT group (n¼ 18) and in the intravenous CBHSCT group (n¼ 19) we observed a trend toward a stronger impact of cell dose in the intravenous CBHSCT group.

Conclusion

IBCBT has been shown to be one of the most reliable solutions to overcome some of the limitations of CBHSCT, but data justifying the risks related to this procedure are still missing. Our data suggest that by intra-bone injection it is possible to overcome the problem of delayed platelet engraftment in CBHSCT even if further data are needed to confirm the results obtained.

Disclosure of Interest

None declared.